TFC T10625 Jacketed (0.625 Jkt Al CATV Cable) 0.25" EHS Strand, Single Lashed

Initial Sag (inches)

Span Length (Feet)	Strand and Cable Ambient Air Temperature												Strand With No Cable		
	0°F	10°F	20°F	30°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F	120°F	30°F	60°F	90°F
100	12	13	14	15	16	17	18	19	20	21	21	23	13	17	19
125	16	17	18	19	20	21	23	24	25	26	27	29	15	21	23
150	19	21	22	23	24	26	27	28	29	31	32	34	18	24	27
175	23	24	26	27	29	30	32	33	34	36	37	40	20	28	31
200	27	28	30	31	33	34	36	38	39	41	42	45	23	31	35
225	30	32	34	35	37	39	41	42	44	46	47	50	25	34	38
250	34	36	38	40	41	43	45	47	49	50	52	56	27	37	42
275	38	40	42	44	46	48	50	51	53	55	57	61	30	39	45
300	42	44	46	48	50	52	54	56	58	60	62	66	32	42	48

Final Sag (inches)
(No Wind)

Span Length (Feet)	Conductor Temperature												0.5" Ice 32°F	0.0" Ice 32°F	86°F
	0°F	10°F	20°F	30°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F	120°F			
100	23	24	25	26	26	27	28	28	29	30	30	31	30	26	29
125	29	30	31	32	33	34	34	35	36	37	38	39	38	32	36
150	35	36	37	38	39	40	41	42	43	44	45	47	47	38	43
175	40	42	43	44	45	46	47	49	50	51	52	54	56	44	50
200	46	47	49	50	51	53	54	55	56	58	59	61	65	50	57
225	51	53	54	56	57	59	60	62	63	65	66	69	74	56	64
250	57	58	60	62	63	65	67	68	70	71	73	76	83	62	71
275	62	64	66	67	69	71	73	74	76	78	80	83	93	68	77
300	67	69	71	73	75	77	79	81	83	84	86	90	102	74	84

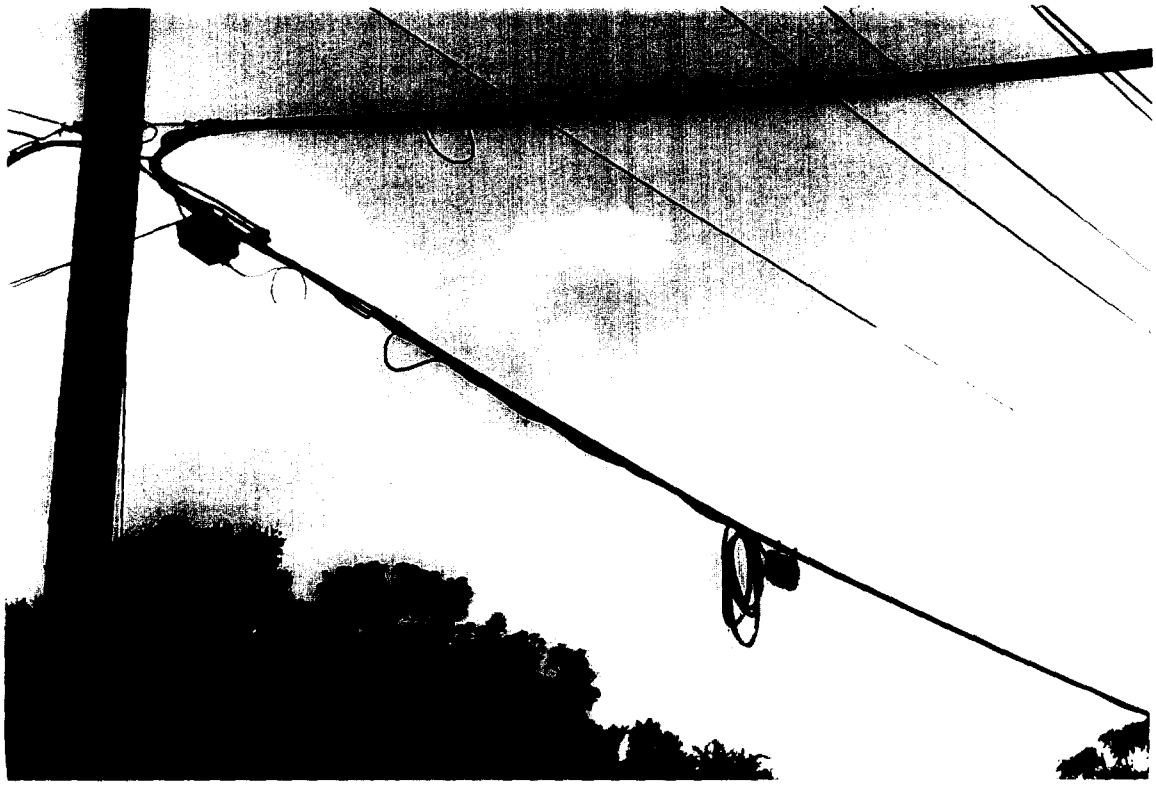
This table is applicable for 1993 NESC Heavy Loading Districts

EXHIBIT 7

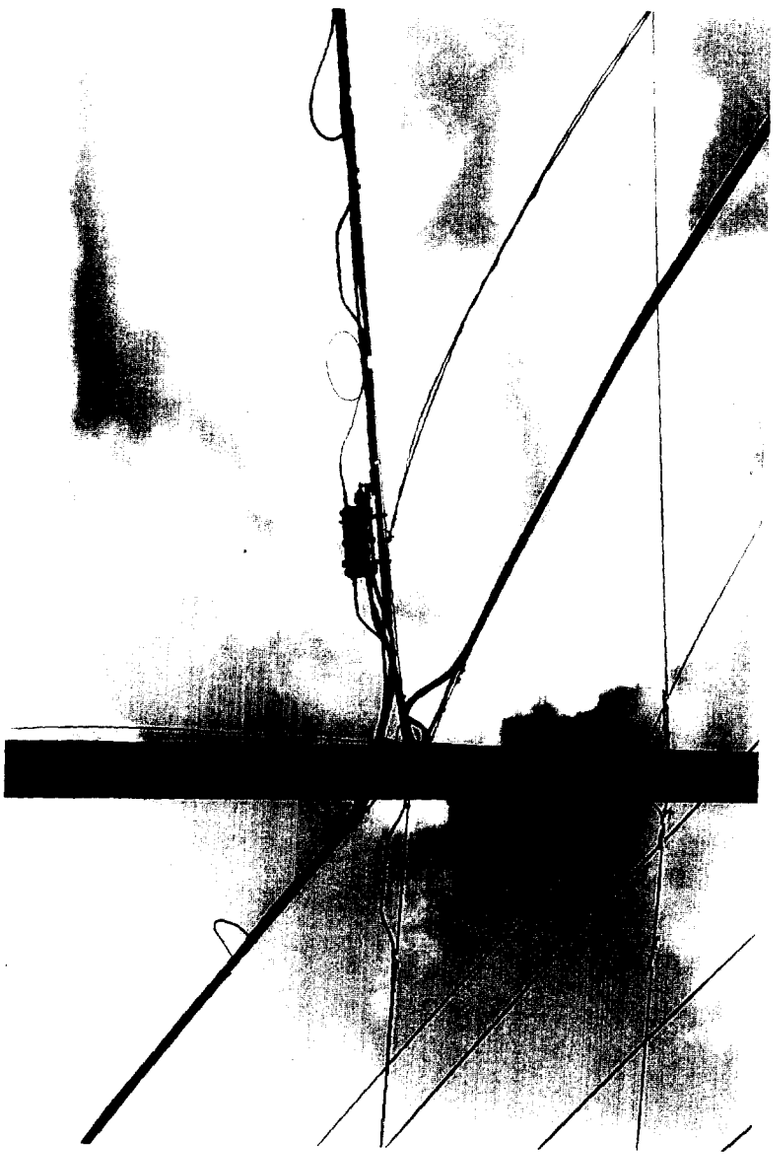
Close up of overlashed cable 3-4" in diameter (CATV)

Overlashing and Power Supply/Junction Box Mid-Span. Secondary Cable is Above.

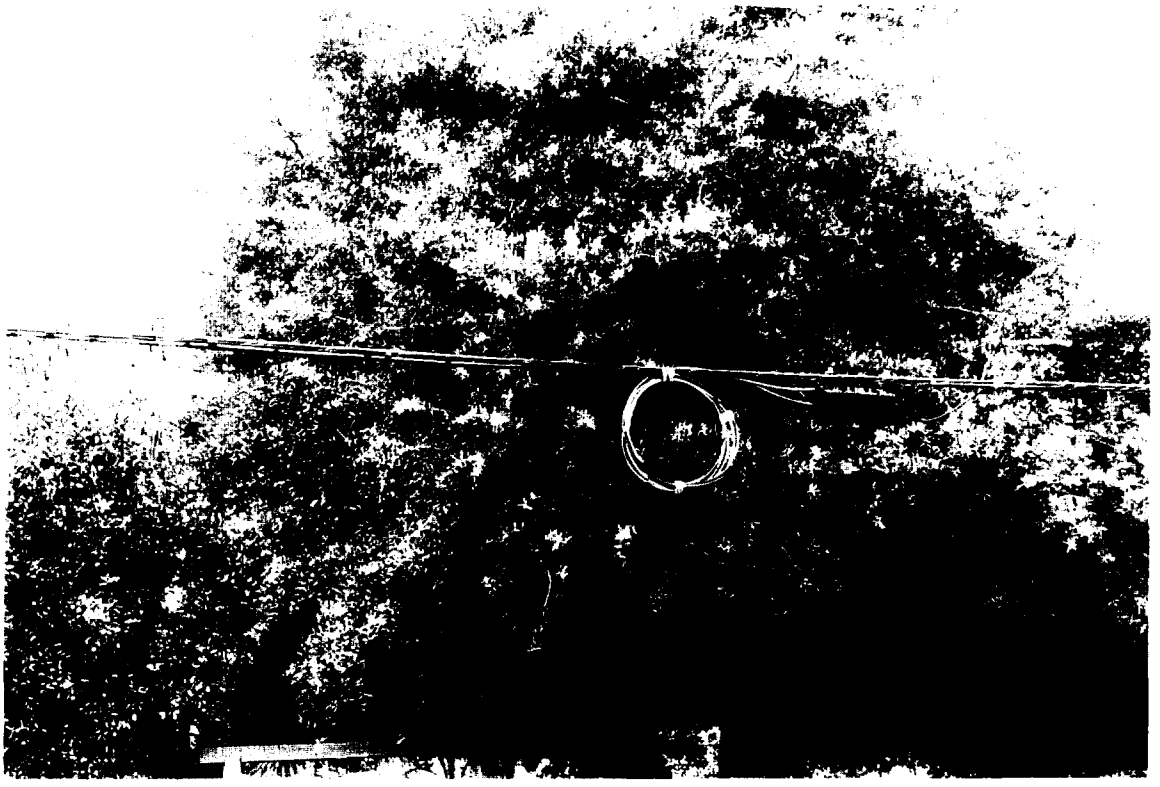
Excessive Sag Caused by Overlashing. Clearance Less than 10'



Another view of 4-way corner showing multiple overlashings.
Note loops hanging down 30' from pole.



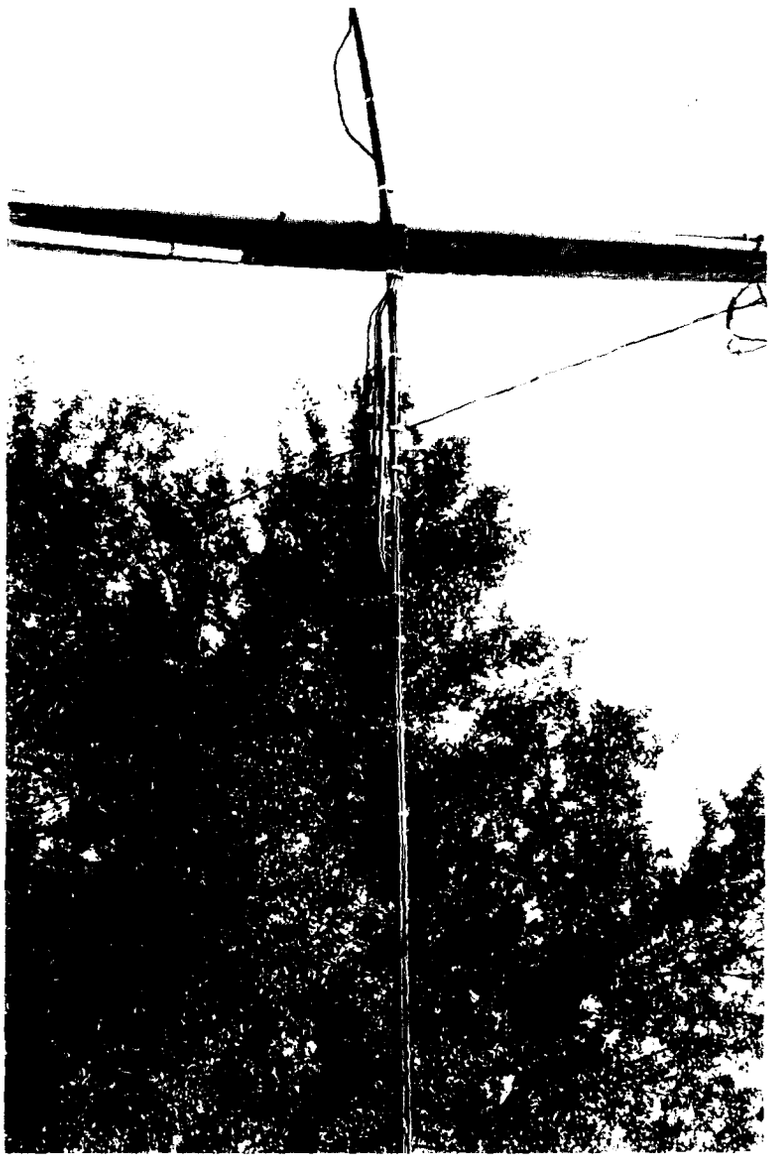
4-Way Corner Pole Showing Multiple Overlashing



Multiple Overlashing and Large Coil of Excess Cable Mid-Span

Overlashed Cable with Excessive Sag

Multiple Overlashing and Large Coil of Excess Cable Mid-Span.



Overlashing with drops down pole. Also have drop coming down pole (grey conduit on left).

Picture showing "loop-backs" in span with overlashing.
Note excesive sag.

EXHIBIT 8

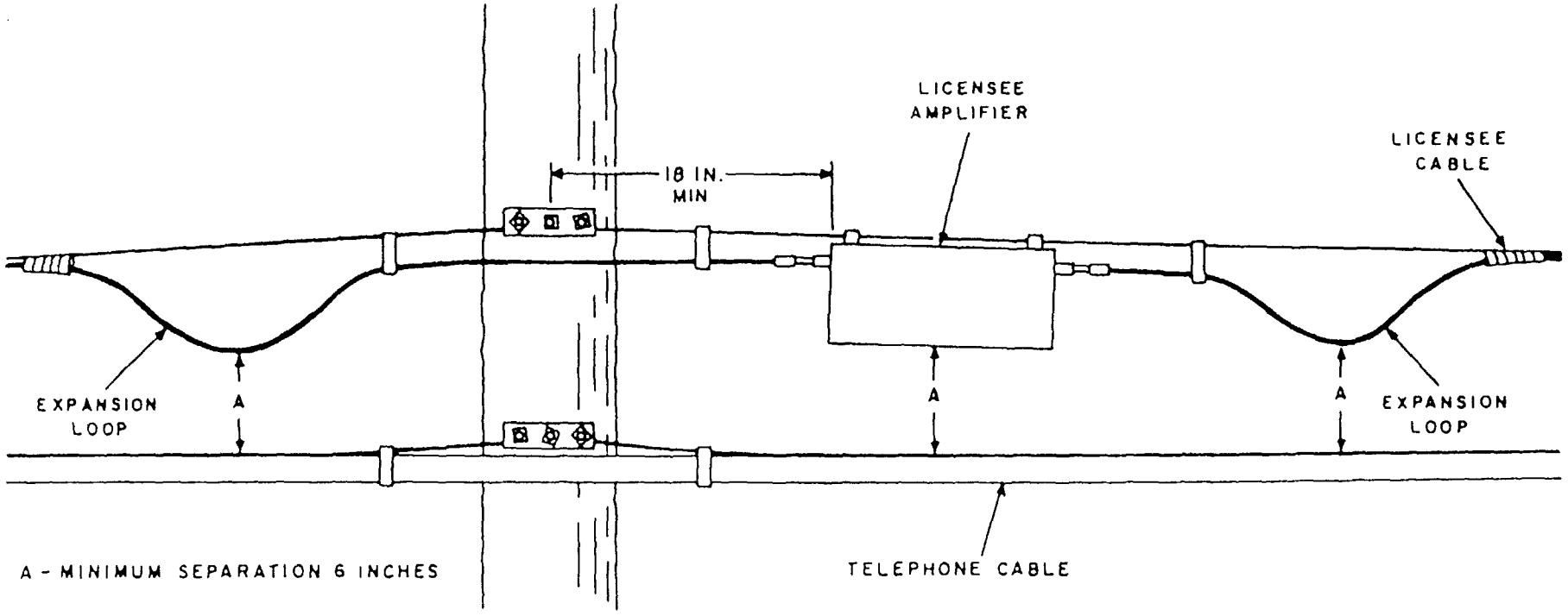
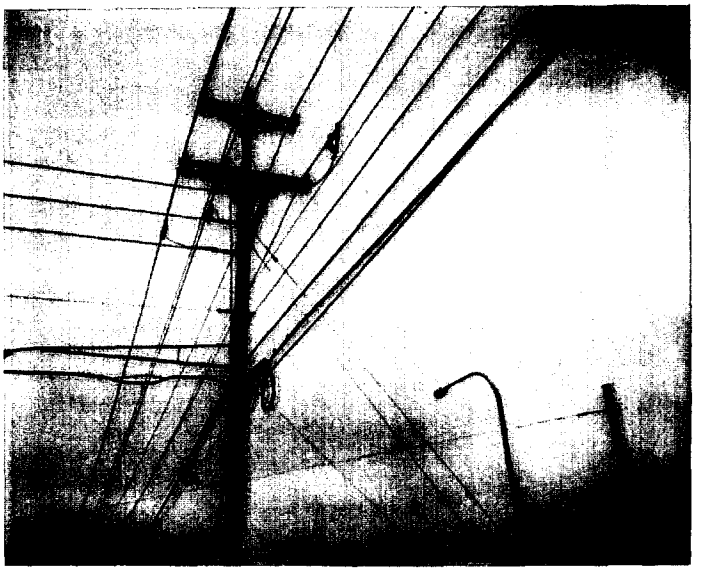


Fig. 2—Vertical Separation Between Strand Mounted Equipment and Other Cable



Pole - 44374/40916

Elevations:	40' 0"	Center of bottom crossarm
	34' 7"	Center of steel buckarm
	27' 1"	Neutral
	26' 1"	Secondary
	25' 1"	Top of Streetlight
	22' 3"	(3) Overlashed CATV Cables
	21' 6"	(2) Bell Messengers

Pole - 44374/40916

Elevations:	40' 0"	Center of bottom crossarm
	34' 7"	Center of steel buckarm
	27' 1"	Neutral
	26' 1"	Secondary
	25' 1"	Top of Streetlight
	22' 3"	(3) Overlashed CATV Cables
	21' 6"	(2) Bell Messengers

Pole - 44444/40603

Elevations:

32' 7"	Top of Phase wire on Ridge Pin
30' 9.5"	Center of Crossarm
25' 0.0"	Top of Streetlight
24' 6"	Secondary/Neutral
21' 0.5"	(3) CATV Cables
20' 1.5"	(4) Bell Cables
18' 8"	(1) Bell Cable

Pole - 44443/40581 (with 54" Pole Top Extension)

Elevations:		
	37' 6"	Top of Phase wire on Ridge Pin
	35' 9"	Center of Crossarm
	32' 5.5"	Top of original Pole
	30' 3.5"	Switch (Center)
	27' 0.5"	Top of Streetlight Bracket
	24' 4.5"	*Secondary/Neutral*
	21' 1"	(3) CATV Cables (one overlashed)
	20' 4"	(3) Bell Cables - overlashed
	19' 5.5"	(1) Bell Cable
	18' 2"	(1) Bell Cable

Pole - 44443/40581 (with 54" Pole Top Extension)

Elevations:	37' 6"	Top of Phase wire on Ridge Pin
	35' 9"	Center of Crossarm
	32' 5.5"	Top of original Pole
	30' 3.5"	Switch (Center)
	27' 0.5"	Top of Streetlight Bracket
	24' 4.5"	Secondary/Neutral
	21' 1"	(3) CATV Cables (one overlashed)
	20' 4"	(3) Bell Cables - overlashed
	19' 5.5"	(1) Bell Cable
	18' 2"	(1) Bell Cable

EXHIBIT 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201
RALEIGH 27611-5201

JAMES G MARTIN
GOVERNOR

THOMAS J HARRELSON
SECRETARY

DIVISION OF HIGHWAYS

WILLIAM G MARLEY, JR., P.E.
STATE HIGHWAY ADMINISTRATOR

July 26, 1991

MEMORANDUM TO: All Utility Manual Holders

FROM: Harold D. Davis
State Utility Agent

SUBJECT: Utility Manual - Revised Vertical Clearance
Electric Safety Code
(1990 Edition)

This is to advise that the July 1, 1989 Utility Manual is currently being revised; however, there is a revision in the Vertical Clearance over roadways (Page 41) that I would like to call to your attention now.

As the 1990 Edition of the NESC allows vertical clearances of wires, conductors and cables above ground surfaces, lower than an Eighteen (18) feet minimum, the Paragraph on Vertical Clearance has been re-written as follows:

Vertical Clearance

A minimum vertical clearance of 18 feet shall be maintained for overhead power and communication lines crossing all highways. The lateral and vertical clearance from bridges should conform with the National Electrical Safety Code; however, greater clearances at bridges may be required by the Department to provide for bridge construction and maintenance. Parallel utility lines occupying highway right of way shall maintain a minimum vertical clearance of 15.5 feet as stated in the National Electric Safety Code.

The Utility Manual Revisions will be sent out as soon as possible; however, if there are any questions, please call me at Telephone (919)733-4420.

HDD:jb

cc: Mr. William G. Marley, Jr., P.E.
Mr. J. T. Peacock, Jr., P.E.
Mr. D. W. Bailey, P.E.
Mr. A. D. Allison, II
Mr. Carl R. Acker, Jr.
Division Engineers
District Engineers

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF HIGHWAYS AND TRANSPORTATION
RICHMOND, VIRGINIA

LAND USE PERMIT MANUAL
MAINTENANCE DIVISION

JANUARY, 1983

(EFFECTIVE NOVEMBER 15, 1983)

as established under 56-265.21 of the Code of Virginia. The location of signs and markers, indicating the type of underground line, who to contact (telephone number), shall be placed when necessary at the discretion of the Resident Engineer. Generally, the location of these signs shall be on the outer edge of the right of way out of the way of normal maintenance operations. Actual locations shall be approved by the Resident Engineer. Erection and maintenance of these markers shall be the responsibility of the utility owner.

2.400 GENERAL OVERHEAD PROVISIONS

Overhead installations on highway rights of way shall comply with the General Provisions of the Land Use Permit Manual (current edition) and shall also include, but not be limited to, the following provisions:

2.410 OVERHEAD INSTALLATION

All overhead installations shall not be placed with less than 18 feet vertical clearance of all primary and secondary roads; a minimum of 21 feet vertical clearance shall be required on Interstate highways at any point at any time. In all cases, vertical clearances shall comply with the standards as required by the National Electric Safety Code (current edition). All roadway crossings shall be made as nearly as possible at right angles to the center of the road.

2.420 LOCATION OF OVERHEAD PARALLEL FACILITIES

All overhead parallel installations placed within the highway rights of way shall be placed on the outer 3 to 5 feet edge of the right of way unless conditions dictate otherwise. However, no aboveground installations (poles, anchors, guys, etc.) shall be placed between the ditch line and the traveled roadway.

COMMERCIAL ENTRANCE PROVISIONS

Commercial entrances shall comply with the applicable General Provisions of the Land Use Permit Manual (current edition) and shall also include, but not be limited to, the following provisions: Note vertical clearances described in Section 2.410 are applicable.

726-2910

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, 23219

RAY D. PETHTEL
COMMISSIONER

C. O. LEIGH
MAINTENANCE ENGINEER

September 1, 1989

Re: Minimum Vertical Clearances
for Utilities located on
State Highways

Mr. K. J. Byrne
Supervisor Distribution Standards
VIRGINIA POWER
Electric Operations GA-03
2400 Grayland Avenue
Richmond, Virginia 23220

Dear Mr. Byrne:

This is in follow-up to our meeting and your letter of August 4, 1989.

You are correct, pursuant to Section 2.410, page 2-10 of our Land Use Permit manual the "minimum" vertical clearance for primary and secondary highway crossings is 18 feet and 21 feet "minimum" over interstate and other limited access highways. The clearance stipulated, however, is a "minimum" and includes no tolerance for line "swag".

Parallel overhead utility line clearances are not stipulated and may be installed in accordance with current national electrical safety codes unless otherwise directed by the resident engineer issuing the utility accommodation permit. However, since the legal height of a truck is 13' 6" overhead parallel, utility lines should be installed with a "minimum" vertical clearance of 14' 0" to facilitate safe entrance access to business and residential properties.

Should you or your staff have any questions, please advise.

Sincerely,

R. M. Ketner, III
Permit and Truck Weight Manager

RMK,III/bcm

cc: District and Resident Engineers
Mr. J. S. Hodge
Mr. D. R. Gehr
Mr. E. C. Cochran, Jr.
Mr. S. A. Waymack
Attn: R. R. Bennett
Mr. C. O. Leigh
Mr. J. K. Skeens
Mr. R. J. Smiley